

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Jochen Kraft, et al.
Serial No. : 10/500,079
Filed : March 1, 2005
Title : TRANSISTOR

Art Unit : 2814
Examiner : Anh D. Mai
Assignee : Austriamicrosystems AG

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Commissioner for Patents
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PRE-APPEAL BRIEF REQUEST FOR REVIEW

We request that a panel of Examiners review the rejections made by the Examiner because of the deficiencies discussed below.

I. Rejection

Claims 1, 2, 4, 7, 11 to 18, and 28 were rejected under the second paragraph of 35 U.S.C. §112 "as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention".

II. Question For Review

We respectfully request the panel to review the following issue: whether the claims are indefinite under 35 U.S.C. §112. We reserve the right to expand the issues or to present new issues when filing an appeal brief.

III. Independent Claims 1 and 13

Independent claim 1 recites a base layer comprising:

- an intrinsic region between the emitter region and the collector;
- an extrinsic region between the intrinsic region and the base contact; and
- a first doping layer that is doped with a trivalent substance, and that extends into the extrinsic region;
- a second doping layer that is doped with a trivalent substance, and that is between the first doping layer and the collector, the first and second doping layers being counter-doped with a pentavalent substance from the emitter region; and
- a third doping layer that is doped with a trivalent substance, and that is between the second doping layer and the collector.

The Office Action, on pages 2 and 3, rejects claim 1 using the following rationale:

There are three scenarios might happen upon the counter-doped:

- A. If the dopant concentration of pentavalent substance were less than that of the trivalent substance, then, the conductivity type of the first and second layers remain P-type.
- B. If the dopant concentration of pentavalent substance were higher than that of the trivalent substance, then, the conductivity type of the first and second layers become N-type.
- C. If the dopant concentration of pentavalent substance were the same as that of the trivalent substance, then, the first and second layers are non-conductive (neutralized).

Claims 1 and 13 appear to encompass both first and second layers being counter-doped.

As shown above, the conductivity of the first and second layers could not be determined.

Therefore, the scope of the claims 1, 2, 4, 7, and 11-18 can not be fairly determined.

We respectfully direct attention to MPEP §2173.04, which explains that claim breadth is not grounds for indefiniteness. In particular, MPEP §2173.04 states:

Breadth of a claim is not to be equated with indefiniteness. In re Miller, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. 112, second paragraph.

In this case, the claims are written broadly so as not to specify the conductivity type of the first and second layers. This comports with the description provided in the specification. For example, as explained in the last response, and in the specification at page 7, lines 21 and 22:

Here, the counter-doping is designed in such a way that the doping of the first doping layer 7 is at least compensated, and may be actually over-compensated.

In response to this argument, on page 6, the Office states:

If "compensated" the conductivity is remained the same type but at a lower concentration, from p to p'.

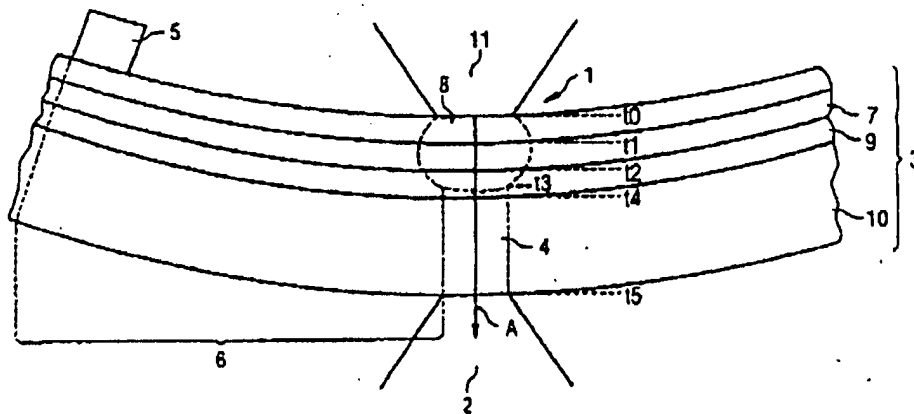
If "over-compensated" the conductivity would become opposite conductivity, from p-type to n-type.

Thus, the true conductivity type of the first and second layer have not been clearly defined, both of which are depended on the counter-dope level.

Since the metes and bounds of the claims have not been clearly defined, claims 1, 13 and 28 and their dependents are indefinite.

Notwithstanding the foregoing, the base layer is being claimed in terms of its doping and counter-doping substances, not in terms of its conductivity. As we see it, the conductivity is not required to specify the "metes and bounds" of claim 1. It is therefore our belief that that one of ordinary skill in the art would understand this claim, as written, in view of the specification.¹

In this regard, Fig. 1 shows an embodiment that is covered by claim 1 in which, element 3 is the base layer, element 7 is the first doping layer, element 9 is the second doping layer, and element 10 is the third doping layer. Element 11 is the emitter region, and element 8 is the pentavalent substance that is used to counter-dope.



For at least the foregoing reasons, claim 1 is believed not to be indefinite. Independent claim 13, which was rejected for similar reasons, is also believed not to be indefinite.

¹ The test for definiteness under 35 U.S.C. 112, second paragraph, is whether "those skilled in the art would understand what is claimed when the claim is read in light of the specification." *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986). (MPEP §2173.02)

IV . Independent Claim 28

Regarding independent claim 28, the Office Action states

Claim 28 recites:

Lines 7-10: a first doping layer that is doped with a *trivalent substance*, that extends into the extrinsic region and that is *counter-doped* with a *pentavalent substance* from the emitter region; wherein the first doping layer comprises a concentration of the trivalent substance that is between $E18$ and $5E20\text{ cm}^{-3}$;...

Lines 11-16: a second doping layer that is doped with the *trivalent substance*, that extends into the extrinsic region, and that is *counter-doped*, at least part-way through, with a *pentavalent substance* from the emitter region, wherein the second doping layer comprises a concentration of the *pentavalent substance* that is between $E20$ and $E21\text{ cm}^{-3}$, wherein the second doping layer comprises a concentration of the *trivalent substance* that is between $E18$ and $E19\text{ cm}^{-3}$; ...

As discussed above in claims 1 and 13, the concentration of pentavalent substance ($E20$ and $E21\text{ cm}^{-3}$) is higher than that of the trivalent substance of the first ($E18$ and $5E20\text{ cm}^{-3}$) and second ($E18$ and $E19\text{ cm}^{-3}$) doping layers, respectively. Therefore, the conductivity type of the first and second layers become N-type, since both are being counter-doped by an higher concentration of pentavalent substance.

Claim 28 is indefinite because, the limitations appear to encompass the first and second doping layers being both N-type and P-type at the same time.

Claim 28 does not require that the first and second doping layers be N-type and P-type "as the same time", as alleged in the Office Action. Rather, claim 28 recites ranges, which is clearly a permissible way of claiming (see MPEP §2131.03). Again, the claim is recited in terms of doping and counter-doping substances, not in terms of conductivity, which the action references.

For these, and the reasons explained above, it is our belief that that one of ordinary skill in the art would understand claim 28, as written, in view of the specification. Accordingly, claim 28 is believed not to be indefinite.

Applicants: Jochen Kraft, et al.
Serial No. : 10/500,079
Filed : March 1, 2005
Page : 5 of 5

Attorney's Docket No.: 14603-007US1
Client Docket No.: P2001,0893USN

V. Dependent Claims 11 and 14

Dependent claims 11 and 14 recite that "the second doping layer and the third doping layer are doped with germanium". The Office Action, however, states

3. Claims 11, 12 and 14-16 are further rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11 and 14 recite: wherein the second doping layer and the third doping layer are doped with germanium.

It is well known in the art that "germanium" is a group IV element. Thus, germanium is neither trivalent nor pentavalent. Therefore, claims 11, 12 and 14-16 are also indefinite.

The Office Action further states:

Note that, the limitation is not "further comprising" but "wherein".

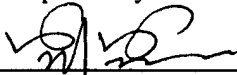
"wherein" signifies the existing doping layer, not "in addition to".

We disagree with the reasoning in the Office Action. There is no connection in the claim between the trivalent and pentavalent substances and germanium. Furthermore, use of a "wherein" clause instead of "further comprising" does not impart such a connection, particularly when the claims are read in view of the specification. Accordingly, we submit that claims 11 and 14, and the claims that depend therefrom, are not indefinite.

Please apply any other required fees to deposit account 06-1050, referencing the attorney docket number 14603-007US1.

Respectfully submitted,

Date: December 4, 2008



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